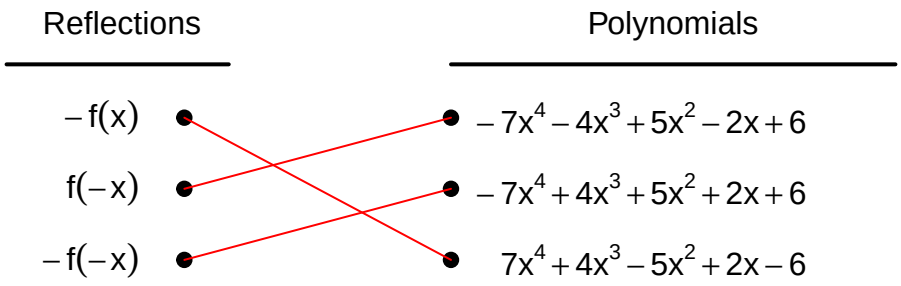
Name: Date:

Exam: Function Reflections (Solution version 32)

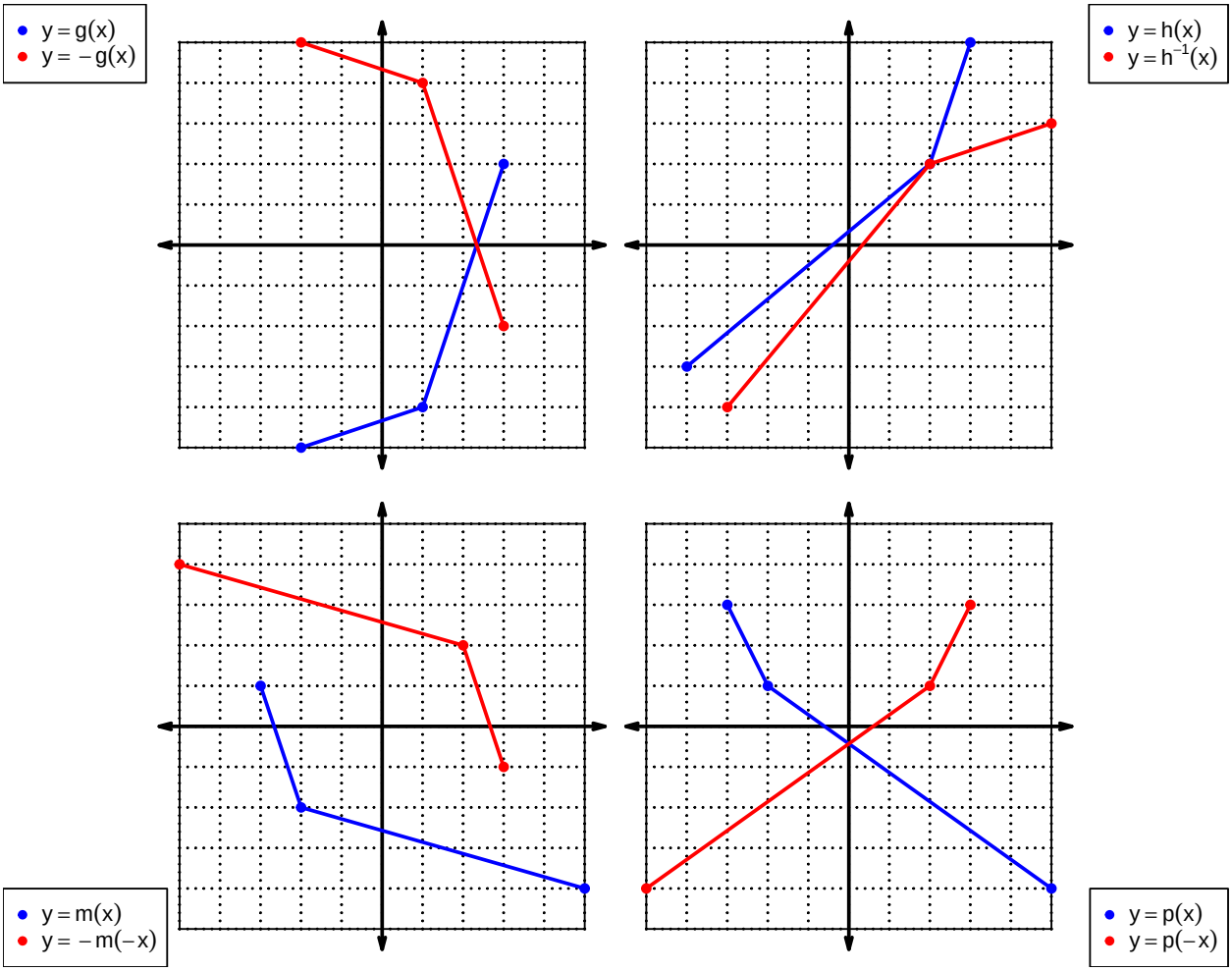
1. Let function f be defined by the polynomial below:

$$f(x) = 7x^4 - 4x^3 - 5x^2 - 2x - 6$$

Draw lines that match each function reflection with its polynomial:



2. In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.



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For all questions on this page, the functions f, g, and h are defined by the table below.

x	$f(x)$	$g(x)$	$h(x)$
1	9	8	7
2	6	9	5
3	5	4	1
4	8	2	9
5	1	6	8
6	7	3	3
7	4	5	2
8	2	7	6
9	3	1	4

3. Evaluate $h(4)$.

$$h(4) = 9$$

4. Evaluate $g^{-1}(7)$.

$$g^{-1}(7) = 8$$

5. By filling more rows of the table, it is possible to make function f **odd**. If that were done, what would be the value of $f(-2)$?

If function f is odd, then

$$f(-2) = -6$$

6. By filling more rows of the table, it is possible to make function g **even**. If that were done, what would be the value of $g(-6)$?

If function g is even, then

$$g(-6) = 3$$

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7. A function, f, is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g, is **odd** if $g(x) = -g(-x)$ for all x in the domain.
   Let polynomial p be defined with the following equation:

$$p(x) = -x^3 - 1$$

   a. Express $p(-x)$ as a polynomial in standard form.

$$p(-x) = -(-x)^3 - 1$$
$$p(-x) = x^3 - 1$$

   b. Express $-p(-x)$ as a polynomial in standard form.

$$-p(-x) = -\left(x^3 - 1\right)$$
$$-p(-x) = -x^3 + 1$$

   c. Is polynomial p even, odd, or neither?

neither

   d. Explain how you know the answer to part c.

We see that $p(x)$ is not equivalent to either $p(-x)$ or $-p(-x)$, so p is neither even nor odd.

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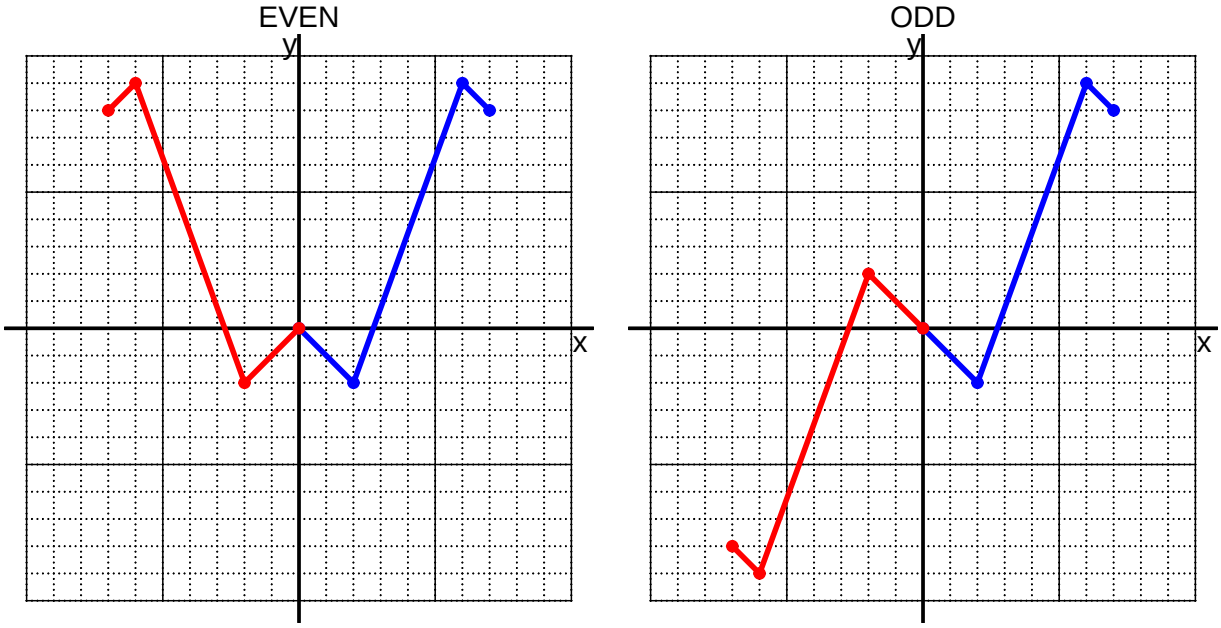
8. I have drawn half of a function. Draw the other half to make it even or odd.



9. Let function f be defined with the equation below.

$$f(x) = 3(x-8)$$

a. Evaluate $f(16)$.

step 1: subtract 8
step 2: multiply by 3

$$f(16) = 3((16)-8)$$
$$f(16) = 24$$

b. Evaluate $f^{-1}(15)$.

step 1: divide by 3
step 2: add 8

$$f^{-1}(x) = \frac{x}{3}+8$$
$$f^{-1}(15) = \frac{(15)}{3}+8$$
$$f^{-1}(15) = 13$$

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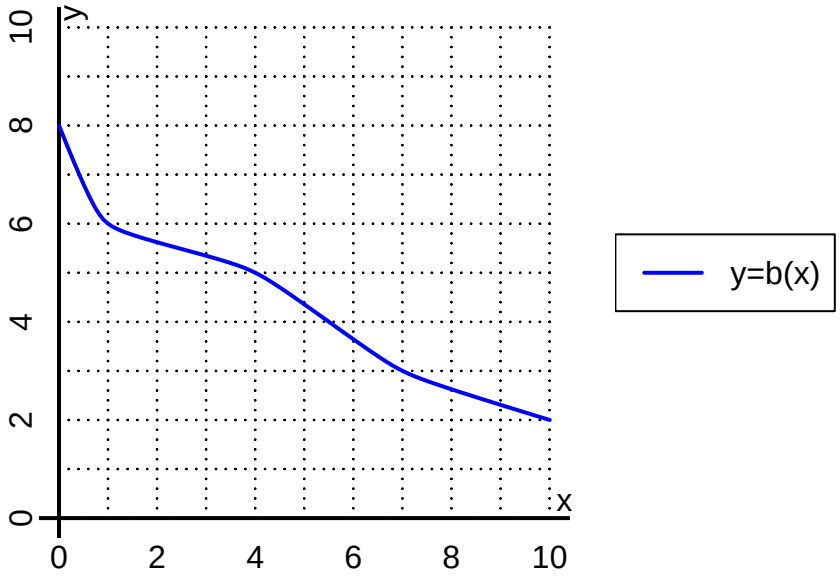
10. The function b is represented by the curve $y = b(x)$ graphed below.



a. Evaluate $b(1)$.

$b(1) = 6$

b. Evaluate $b^{-1}(5)$.

$b^{-1}(5) = 4$

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11. Function f is defined by the table below.

    a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

x	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	7	-7	7	-7
-1	-5	5	-5	5
0	0	0	0	0
1	-5	5	-5	5
2	7	-7	7	-7

b. Is function f even, odd, or neither?

even

c. How do you know the answer to part b?

Function f is even because column $f(-x)$ matches column $f(x)$ exactly.